ABSTRACT

An inventive Medium Access Control (MAC) protocol for powerline networking systems is described. The inventive MAC protocol controls access to and use of a physical medium (power lines) in a powerline networking system. The MAC protocol method and apparatus includes a method of providing "blanking intervals" in which devices using newer versions of the protocol "clear out" earlier version devices. The use of blanking intervals greatly eases backward compatibility of the network when the protocol is upgraded with new versions. The method of using blanking intervals is closely coupled to a technique of using "beacons." The beacons are used to propagate blanking interval information throughout the network. The beacons also include a mechanism for informing devices of the expiration of blanking information. The MAC also includes a method of establishing and maintaining "virtual circuit" connections between selected devices on the network. The virtual circuits can be established in powerline networking systems not having a central controller. A method of assigning unique Logical Network Identifiers (LNIs) to logical networks in the powerline networking system is also described. The LNIs uniquely identify each of the logical networks in the network. A means for creating, managing and distributing network encryption keys is also described. The encryption keys are used by the devices in the powerline networking system to prevent data from being shared with unauthorized users.